

MH 16 W8

Amend. 1/23/45

Instituto Butantan, Caixa Postal 65

São Paulo, September 11th, 1944.

Dr. M. Heidelberger  
333 Central Park West  
New York, N.Y.

Dear Dr. Heidelberger:

Many thanks for your kind letter of April which arrived here only in July. The manuscript on bovine complement sent to you has apparently been lost on the way, so I am sending you another copy.

It may interest you to know that I have been appointed Director of Butantan Institute - the wellknown Institute for the preparation of snake antivenoms. This represents, of course, a great honor to me, but at the same time a misfortune: very little time for the laboratory and a lot of administrative work to do. Guilty in Prof. Rocha Lima, my former Director at the Biological Institute, who suggested my name to the government. (I know that now). I could not simply say no to the invitation since there is a lot of war work to do at Butantan, such as vaccines and antitoxins, liophilization of human blood plasma for the armed forces, etc. Anyhow, I expect to be released from this "big shot" job soon after the war and go back to my laboratory at the Biological Institute. I also dream already with the possibility to return to the United States, when, with peace of mind, I shall be able to work with you on that "No.1 Jig Saw Puzzle" you talked about in your letter.

By ordinary mail I am sending you the reprint of a paper published in the Rev. Bras. Biol. on the order of fixation of the complement-components. I should like to draw your attention to a very simple experiment referred in that paper, the interpretation of which is still obscure to me: If you take sensitised cells, add  $\text{NH}_3$  - Serum, incubate at  $37^\circ$  and after varying intervals add  $56^\circ$  - Serum, you will have a result like that:

Simultaneous addition of  $\text{NH}_3$  and  $56^\circ$  Serum - Complete hemolysis in 3 minutes.

56°-Serum	added	10 minutes	after the	$\text{NH}_3$ -Serum	-	C.H. in 3'.
"	"	"	20	"	"	- C.H. in 10'.
"	"	"	30	"	"	- C.H. in 40'.
"	"	"	60	"	"	- Partial Hemolysis in 60'.
"	"	"	120	"	"	- No hemolysis in 60'.

I think that this simple experiment lends further support to the idea that C'4 and C'1 must be fixed simultaneously for the full development of the hemolytic activity of the complement.

I am now making quantitative determinations on a Ramon type of flocculation with snake (*Crotalus*) venom and the specific antivenom: the ratio between antivenom-N and venom-N seems to be very close to 10 (the venom has been chemically studied by Slotta et al., who isolated and crystallised a protein with a molecular weight of 33.000).

Unfortunately, as I said before, the research work has to be

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done in the intervals of administrative work, and it takes months to do a thing that you could have done in a few weeks.

I also hope that you will be released soon from all the war work you must have, although it is interesting too.

With my best greetings to all the friends at the laboratory (Manfred, Mrs. Mc Pherson, Soo-Hoo, Mary) and my special regards to Mrs. Heidelberger, also from my wife,

Sincerely,

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